Burnt Corral Vegetation Management Project
Heritage Resources Specialist Report

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Introduction

The North Kaibab Ranger District (NKRD) is conducting an Environmental Assessment Analysis of approximately 28,086 comprising the Burnt Corral Vegetation Management Project. The project area lies on the western slopes of the Kaibab Plateau. Elevation within the project boundaries ranges from 6760 feet within the western portion of the project area along the winter road (FSR 427) to 8080 feet on the ridges above Lookout Canyon. The topography consists of a complex system of ridges, deeply incised canyons, meadowlands, and sinkholes. There are four distinct vegetative zones including the pinyon-juniper/sage woodland, the transitional oak/pinyon-juniper/ponderosa pine forest, the ponderosa pine forest, and the transitional ponderosa pine-mixed conifer forest.

The overall goal of the project is to restore forest health, beneficial fires regimes, and wildlife habitat in the ponderosa pine belt on the west side of the Kaibab Plateau through various vegetation management techniques. Methods will include mechanical and hand felling and piling, prescribed burning, pile burning and containment line construction. The project aims to improve habitat, making conditions more resilient to change in the event of wildfire and/or other climatic condition changes.

As part of the environmental analysis process, the project area was inventoried for heritage resource properties between 2013 and 2016 (Betenson 2016). This report summarizes possible effects of proposed activities to heritage resource sites, and provides recommended mitigation measures to avoid adverse effects to resources within the Burnt Corral Vegetation Management Project area. It also documents consultation efforts with the Arizona State Historic Preservation Officer (SHPO), Kaibab Band of Southern Paiute Indians, the Hopi Tribe, Zuni Pueblo, and the Navajo Nation.

Human History

A wide range of site types dating to the prehistoric and historic periods exist within the project area and demonstrate a continual use of the Kaibab Plateau. While evidence of Paleo-Indian occupations is currently limited to one modified obsidian Clovis spear point on the Kaibab Plateau (8-11,000 B.P.), Archaic (8950-1950 B.P.) material is abound across the entire district. Multiple sites within the project area contain Archaic period projectile points, moderate lithic scatters and ground stone. These locales may represent

collecting and processing areas. The presence of late-stage debitage suggests that tools were also sharpened at these locations. These occur across the project area but are most concentrated on the [redacted], at around [redacted] feet where pine nuts, acorns and other plant protein sources occur.

A significant shift in resource acquisition occurred during the Formative period, beginning with the adoption of agriculture at around 2450-2250 B.P. During this transition period, Basketmaker people inhabited pit houses and use slab-lined cists for their primary means of storage. Farming and sedentism intensified by A.D. 800 (Pueblo I) and culminated in the Late Pueblo II-Early Pueblo III period (A.D. 1150-1200) when populations grew to their highest numbers. Around the end of the Pueblo II period, sedentary agriculturalists vanish from the archaeological record. Although this phenomenon is still poorly understood, evidence points to climatic changes that made farming in the Four Corners area difficult. Ancestral Puebloans likely migrated to the north and east to Hopi, Zuni and the northern pueblos where population increases are documented during this period. Seventeen sites within the project contain components that date to the Ancestral Puebloan period. Most of these sites are located [redacted] of the project area.

Nearly one-third of the prehistoric lithic sites within the project area could not be dated in the field because they lacked diagnostic artifacts. While some of these lithic scatters may be evidence of Archaic occupation, others may date to the Protohistoric Period and represent Southern Paiute use of the Plateau. Though the Southern Paiutes physical imprint on the land was light, one Desert Side-notch was found. As during the Archaic period, the pine and oak belt of the [redacted] of the project may have been most appealing to the Paiutes for plant gathering opportunities it provided. Ethnographic accounts describe the Kaibab Plateau as a primary hunting and collecting area for the Kaibab Paiutes. They camped at springs and accessed wild resources on a seasonal basis (Kelly 1976). Rather than staying in one place all year, they made homes for a season two to harvest particular resources. Stone houses were not constructed by the Southern Paiutes; rather they lived in rock shelters in the colder months and lightly constructed brush shelters or wickiups in during warmer weather.

Historic sites within the project area include cabins, sawmills, corrals, hunting camps, road segments, and trash scatters. All of these locations have played key roles in the history of the Kaibab Plateau. Historic themes applicable to this area include ranching, logging, tourism, early Forest Service history, the Grand Canyon National Game Preserve and the Kaibab mule deer herd.

The Grand Canyon Game Reserve was established in 1906 by President Theodore Roosevelt to protect big game. Creation of the game preserve restricted hunting of mule deer on the Kaibab for over two decades. In an effort to regulate deer populations, hunting camps were established across the district including those at Big Saddle and Pine Flat. These hunting camps were in use as early as 1927 and persisted until the 1940s.

The first sawmill on the district was reportedly a portable steam-powered operation brought to Big Springs by Levi Stewart in 1871 from in Skutumpah area, north of Kanab, Utah. The mill was dismantled and moved to Castle Springs and then to Riggs Springs. The Castle Spring Sawmill Site is located within the project boundary. At that time, a permanent water source was required to provide steam to power the mill. Logging activity did not intensify on the Kaibab Plateau until the 1950s, when a demand for building timbers by baby boomers and the availability of trucks made larger-scale operations possible. Several historic trash scatters found during this inventory, containing household items common at long-term camps and metal debris associated with logging operations are likely tied to mid-century timber sales.

Grazing has occurred on the Kaibab Plateau since the late 1800s but was most prominent in the early 20th century. After WWII, the demand for sheep products lessened and the country shifted its livestock production to cattle. Little physical evidence remains of the early ranching history but tin can camps and thousands of dendroglyphs. The Big Saddle range allotment cabin and corral, built in the late 1960s or early 1970s are part of this history.

Existing Condition

In order to analyze effects of the proposed project on heritage resource sites, field inventory was necessary to identify the location of the sites within the project area, determine the unique characteristics of each site, and establish appropriate mitigation measures as needed. Therefore, archaeological survey was conducted over four field seasons by seasonal and permanent archaeological staff, as funding permitted. Between 2013 and 2016, archaeologists surveyed 12,491 acres. An estimated 7,965 acres of previous survey met current standards. Much of the Burnt Corral landscape is dissected by steep drainages and hill slopes. A total of 20,456 acres of the 28,086-acre project area were intensively surveyed for a total of 73% coverage.

The 2006 NKRD Survey Strategy guidelines were followed in during the Burn Corral survey (Reid and Hanson 2006). As per the survey strategy, a complete inventory using 20-30 meter transects was conducted on all flat areas within the ponderosa pine forest. Transects were narrowed to 15 meters in the lower pinyon-juniper/sage and pine/oak transition zone, where site densities were expected to be higher and visibility was impaired by vegetation. Surveyors focused on ridge tops, saddles, sink holes, drainage heads, wide drainage bottoms and other relatively flat areas. Steep side-slopes were not surveyed as outlined in the strategy (Reid and Hanson 2006); however, this terrain was sampled when accessing medium and high probability areas. Aspen dendroglyphs encountered in the project area were recorded in accordance with the dendroglyph recording guidelines established by the North Kaibab Ranger District in consultation with the Arizona State Historic Preservation Office (Haynal and Reid 2002).

Scattered locations within the Burnt Corral project area were surveyed, completely or in part, prior to this project for timber sales, prescribed burns, road construction and

maintenance projects, and range improvements. Numerous surveys have been conducted within the project area over the last 30 years (Betenson 2003, 2006, 2006a, 2009, 2011; Cartledge 1978, 1985; Davenport, J.C. 1987, 1987a; Davenport M.A. 1985, 1985a, 1988, 1988a, 1991; Dosh 1992, 1993; Dussinger 1996; Dussinger, M.A. and J.A. Hanson 1996; Green D.F 1975; Hangan, Weintraub, Lyndon, Reid, and Betenson 2009; Haynal and Reid 2002, 2002a; Lesko 1997; Logan and Mueller 1990; Nicholas and Betenson 2008; Nicholas, Reid and Betenson 2006, 2006a; Nicholas and Reid 2005; Parsons and Woodard 2007; Reid 1990, 1998, 2001, 2006; Reid and Betenson 2012; Reid and Hanson 1999; Schiowitz 1981, 1981a; Stevens 1992; Tyree and Reid 1998; and Wood 1975). Significant inventories occurring in the past within the current project boundary include the Bridger Salvage Sale (Dussinger and Hansen 1996), the Kane Ranch Allotment Management Plan (Reid and Hanson 1999) and Plan Revision (Reid and Betenson 2012), and the Plateau Fire Facilities Protection Project (Betenson 2009).

Ground visibility varied throughout the project area, depending on slope and aspect. Visibility across the eastern two-thirds of the project in the ponderosa pine belt ranged from poor to good, with a significant layer of pine needle cast covering the forest floor and possibly obscuring artifacts. In this environment, open areas including natural clearings and man-made roads or campsites were inspected intensively and occasionally yielded artifacts. On the western side of the project, impacted by the Bridger Fire, vegetation was denser than the eastern two-thirds. Ground visibility and navigation was compromised in the summer and fall when shrubs were most full. Early spring generally provided better visibility when oak and locust were dormant and fallen leaves from the previous season had begun to decompose. Overall, visibility was generally poor to fair during the summer and early fall months.

Archaeological sites within the project area are primarily prehistoric with several notable historic properties. Over four field seasons, twenty-nine new sites and forty-six isolated occurrences were recorded. Thirty-eight previously recorded sites and seven isolated occurrences identified during the Bridger Salvage Sale are present within the project area. All thirty-eight previously recorded sites were monitored within the project area. Historic sites include Forest Service hunting camps, sawmills, cabins, corrals, and trash scatters. Specific historic resources include the Big Saddle Cabin and Hunting Camp (03-233, -1384), the Johnson Sawmill (03-587), Castle Spring Sawmill 03(-1694), Westlake Corral (03-587/780), Pine Flat Tank 03(-3294), and Road Hollow Tank (03-3316) and an old section of the Forest Service " 22" road (03-1658).

Prehistoric sites are predominantly [redacted], although ten sites containing [redacted] exist within the project area (03-1390, -1475, -1476, -3298, -3299, -3311, -3312, -3313, -3314, and -3315) and an additional seven contain possible [redacted] that require subsurface testing to substantiate the authenticity of the features and the antiquity of the site (03-1391, -3155, -3314, -3319, -3320, -3321, and -3322). The majority of lithic scatters identified within the project area are small assemblages of tertiary and secondary flakes, likely representing an expedient tool making or sharpening event. There are also several possible [redacted] (03-583, -584, and -585) comprised of cores and thousands of flakes that

include a large percentage of primary flakes. The majority of artifact scatters, with or without structures, contain [redacted]. The presence of [redacted] suggests that [redacted] activities occurred at these locations.

Laws, Regulations, and Policy

Federal land managers are responsible for the protection and enhancement of significant heritage resources under 36 CRF 800 as per sections 106 and 110 of the National Historic Preservation Act (NHPA), as amended. These include both physical manifestations of past human activities, as well as specific locations that are traditionally important to interested tribes. Federal agencies are charged with avoiding or minimizing impacts to significant archeological and historical sites, as well as traditional cultural properties. To achieve this, the location, nature, and condition of existing heritage resources are identified and documented prior to implementing any Federal undertaking. Significant resources are protected either through project avoidance, or through various mitigation measures developed by the agency in consultation with the State Historic Preservation Office (SHPO) and the Advisory Council on Historic Places (ACHP). A cultural resource clearance report for the Burnt Corral project was submitted to the Arizona SHPO in November of 2016, in compliance with Section 106 of the NHPA (Betenson 2016). The SHPO concurred with the adequacy of the analysis and proposed mitigation measures to protect historic properties within the project area (SHPO response dated 11/30/2016).

NHPA, the American Indian Religious Freedom Act (AIRFA), as well as various other laws and regulations require that agencies consult with culturally affiliated tribes to determine the effects of the projects on sites and areas culturally significant to the tribes. Ongoing consultation with tribes has indicated general support of restoration treatments that will return the Forest to historic conditions provided impacts to cultural and natural resources are mitigated. The Kaibab National Forest consulted with the Kaibab Band of Southern Paiute Indians on November 25, 2014, December 3, 2015 and May 9, 2016, the Hopi Tribe on October 22, 2014, June 4, 2015 and November 10, 2015, and the Zuni Tribal Council on November 14, 2014 and August 26, 2015 to identify traditional properties and other resources of concern within the project area as per memoranda of agreement between the Forest Service and the Tribes. The Navajo Agency of the Navajo Nation was also consulted on October 23, 2014 and August 27, 2015. The Kaibab Paiute expressed support for efforts to enhance culturally important plant species. No questions, comments or concerns about the project were received by the Forest.

Project Alternatives

No Action Alternative:

Current and existing management plans would continue to guide the project area. Hand or machine felling or piling, prescribed burning, or pile burning would not occur. This

alternative is developed to comply with the National Environmental Policy Act, which requires that a no action alternative be analyzed as an environmental baseline for evaluation of action alternatives. This alternative would retain the existing condition.

Proposed Action:

The action proposed by the Forest Service is to improve forest health and vigor, while improving habitat conditions which are more resilient to change in the event of wildfire and/or other climatic condition changes, through hand or mechanical thinning and prescribed burning methods. In working toward this goal, the project also seeks to work collaboratively with diverse stakeholders to reach a general consensus on recommendations and approaches to guide management and develop and sustain public support for on-the-ground restoration actions.

Mitigation Measures and Effects Analysis

No Action Alternative:

Mitigation: No mitigation is necessary.

Effects: The *No Action* alternative would not alter the existing condition and would have no direct effect on heritage resources. However, existing fuel loading could have an indirect effect on heritage sites *in the event* of catastrophic wildfire which frequently results in adverse effects to heritage resource sites as previously discussed.

Proposed Action:

Mitigation: The activities listed in the *Proposed Action* alternative, including timber harvesting, mechanical thinning and piling, construction of log landings, skid tracks, fire suppression lines, and burning operations have the potential to directly impact heritage resource sites. Many of the techniques utilized for timber harvesting, mechanical thinning, and fuels treatments are potentially ground disturbing. Heavy equipment used to drag and pile trees and brush or load logging trucks disturb the ground surface. Additionally, using blades to clear brush for ingress and egress to treatment areas, establishing log landings to stack timber, and clearing fire containment lines generate ground disturbance. These activities can displace or crush artifacts and features. Fire can consume some artifacts and features, and cause permanent damage to others. Burning of slash piles or densely scatter woody debris across a site typically results in higher fire temperatures and longer duration burning than would otherwise be experienced by low intensity fires, thus generating the potential for more severe damage to artifacts and features. These activities can pose significant adverse effects to heritage sites if not mitigated.

In order to protect heritage resource sites, all sites have been identified and documented using cultural resource survey standards as per the North Kaibab Survey Strategy (Reid

and Hanson 2006). The standard survey procedures are designed to identify and document sites visible on the surface of the ground, complying with the acceptable professional standards identified in the *Programmatic Agreement for Compliance with Section 106 of the National Historic Preservation Act for Undertakings in Region 3, USDA Forest Service*. However, given the inherent difficulties posed by heavy surface duff or dense vegetation, not all sites will be located using standard the survey methodology. Consequently, forest site protection requirements stipulate that in the event an undocumented site is unearthed during ground disturbing activities, implementation activities will cease and the NKRD archaeologist will be contacted to assess the remains and complete any legal consultation required.

In addition to accidental discovery protection protocols, standard site protection design criteria are utilized to protect heritage sites. These design criteria meet site protection standards in accordance with the provisions in the *Programmatic Agreement for Compliance with Section 106 of the National Historic Preservation Act for Undertakings in Region 3, USDA Forest Service* and comply with best management practices (USDA Forest Service North Kaibab Ranger District 2010).

These protection measures are summarized as follows. All unevaluated heritage resource sites or sites eligible to the National Register of Historic Places must be avoided during the implementation of any ground disturbing activities. Hand thinning may occur at archaeological sites and architectural features identified for prescribed burning to reduce fuel loading if it is deemed necessary. However, Kaibab National Forest archaeologists will help direct hand thinning operations within site boundaries. While low intensity prescribe fire is permitted at non-fire sensitive sites, no piling of slash, pile burning or broadcast burning of slash is authorized atop any sites. Table 1 summarizes specific site protection measures for each identified site within the Burnt Corral project boundaries.

Table 1: Site Protection Measures and Potential Effect

Site #	Eligibility	Site Type	Site Protection Measures	Effect
86	Unevaluated	[redacted]	1. No mechanical thinning within site boundaries. Hand thinning permitted. 2. No piling or burning of slash within site boundaries. 3. Low intensity prescribed fire permitted.	No Adverse
156	Unevaluated	[redacted]	1. No mechanical thinning within site boundaries. Hand thinning permitted. 2. No piling or burning of slash within site	No Adverse

			boundaries. 3. Low intensity prescribed fire permitted.	
233	Unevaluated	[redacted]	1. No mechanical thinning within site boundaries. Hand thinning permitted. 2. No piling or burning of slash within site boundaries. 3. No prescribed burning within site boundaries.	No Adverse
583	Unevaluated	[redacted]	1. No mechanical thinning within site boundaries. Hand thinning permitted. 2. No piling or burning of slash within site boundaries. 3. Low intensity prescribed fire permitted.	No Adverse
584	Unevaluated	[redacted]	1. No mechanical thinning within site boundaries. Hand thinning permitted. 2. No piling or burning of slash within site boundaries. 3. Low intensity prescribed fire permitted.	No Adverse
585	Unevaluated	[redacted]	1. No mechanical thinning within site boundaries. Hand thinning permitted. 2. No piling or burning of slash within site boundaries. 3. Low intensity prescribed fire permitted.	No Adverse
586	Unevaluated	[redacted]	1. No mechanical thinning within site boundaries. Hand thinning permitted. 2. No piling or burning of slash within site boundaries.	No Adverse

			3. Low intensity prescribed fire permitted.	
587	Unevaluated	[redacted]	1. No mechanical thinning within site boundaries. Hand thinning permitted. 2. No piling or burning of slash within site boundaries. 3. No prescribed burning in site boundaries.	No Adverse
589/ 780	Historic component determined *ineligible* on 6/3/2000 Prehistoric component Unevaluated	[redacted]	1. No mechanical thinning within site boundaries. Hand thinning permitted. 2. No piling or burning of slash within site boundaries**.** 3. Low intensity prescribed fire permitted.	No Adverse
759	Unevaluated	[redacted]	1. No mechanical thinning within site boundaries. Hand thinning permitted. 2. No piling or burning of slash within site boundaries**.** 3. Low intensity prescribed fire permitted.	No Adverse
1063	Unevaluated	[redacted]	1. No mechanical thinning within site boundaries. Hand thinning permitted. 2. No piling or burning of slash within site boundaries**.** 3. Low intensity prescribed fire permitted.	No Adverse
1069	Unevaluated	[redacted]	1. No mechanical thinning within site boundaries. Hand thinning permitted. 2. No piling or burning of slash within site boundaries**.** 3. Low intensity	No Adverse

			prescribed fire permitted.	
1070	Unevaluated	[redacted]	1. No mechanical thinning within site boundaries. Hand thinning permitted. 2. No piling or burning of slash within site boundaries**.** 3. Low intensity prescribed fire permitted.	No Adverse
1071	Unevaluated	[redacted]	1. No mechanical thinning within site boundaries. Hand thinning permitted. 2. No piling or burning of slash within site boundaries**.** 3. Low intensity prescribed fire permitted.	No Adverse
1384	Unevaluated	[redacted]	1. Consider visuals when thinning around historic facilities. 2. Protect historic facilities from prescribed burning and pile burning operations.	No Adverse
1390	*Eligible* as per PMOA	[redacted]	1. No mechanical thinning within site boundaries. Hand thinning permitted. 2. No piling or burning of slash within site boundaries**.** 3. Low intensity prescribed fire permitted	No Adverse
1391	Unevaluated	[redacted]	1. No mechanical thinning within site boundaries. Hand thinning permitted. 2. No piling or burning of slash within site boundaries**.** 3. Low intensity prescribed fire permitted	No Adverse

1475	*Eligible* as per PMOA	[redacted]	1. No mechanical thinning within site boundaries. Hand thinning permitted. 2. No piling or burning of slash within site boundaries. 3. Low intensity prescribed fire permitted	No Adverse
1476	Determined *Eligibl*e 11/02/1998	[redacted]	1. No mechanical thinning within site boundaries. Hand thinning permitted. 2. No piling or burning of slash within site boundaries. 3. Low intensity prescribed fire permitted	No Adverse
1489	Unevaluated	[redacted]	1. No mechanical thinning within site boundaries. Hand thinning permitted. 2. No piling or burning of slash within site boundaries. 3. No prescribed fire permitted within site boundaries.	No Adverse
1532	Unevaluated	[redacted]	1. No mechanical thinning within site boundaries. Hand thinning permitted. 2. No piling or burning of slash within site boundaries. 3. Low intensity prescribed fire permitted	No Adverse
1655	Unevaluated	[redacted]	1. No mechanical thinning within site boundaries. Hand thinning permitted. 2. No piling or burning of slash within site boundaries. 3. Low intensity prescribed fire permitted	No Adverse

1656	Determined *Eligible* 9/4/2001		1. No mechanical thinning within site boundaries. Hand thinning permitted. 2. No piling or burning of slash within site boundaries**.** 3. No prescribed fire permitted within site boundaries.	No Adverse
1657	Unevaluated		1. No mechanical thinning within site boundaries. Hand thinning permitted. 2. No piling or burning of slash within site boundaries**.** 3. Low intensity prescribed fire permitted	No Adverse
1658	Unevaluated		Low intensity burn only around rock feature.	No Adverse
1694	Unevaluated		1. No mechanical thinning within site boundaries. Hand thinning permitted. 2. No piling or burning of slash within site boundaries**.** 3. No prescribed fire permitted within site boundaries.	No Adverse
1749	Determined *ineligible* 2/24/2002	Burnt Corral Tank	No protection required.	NA
1770	Unevaluated		. No mechanical thinning within site boundaries. Hand thinning permitted. 2. No piling or burning of slash within site boundaries**.** 3. No prescribed fire permitted within site boundaries.	No Adverse
1771	Determined	Historic Trash Scatter	No protection	NA

	ineligible 2/24/2002		required.	
1775	Unevaluated	[redacted]	1. No mechanical thinning within site boundaries. Hand thinning permitted. 2. No piling or burning of slash within site boundaries**.** 3. Low intensity prescribed fire permitted	No Adverse
1776	Unevaluated	[redacted]	1. No mechanical thinning within site boundaries. Hand thinning permitted. 2. No piling or burning of slash within site boundaries**.** 3. Low intensity prescribed fire permitted	No Adverse
1814	Determined *ineligible* 2/24/2002	Historic Trash Scatter	No protection required.	NA
2443	Unevaluated	[redacted]	1. No mechanical thinning within site boundaries. Hand thinning permitted. 2. No piling or burning of slash within site boundaries**.** 3. Low intensity prescribed fire permitted	No Adverse
2444	Unevaluated	[redacted]	1. No mechanical thinning within site boundaries. Hand thinning permitted. 2. No piling or burning of slash within site boundaries**.** 3. Low intensity prescribed fire permitted	No Adverse
2445	Unevaluated	[redacted]	1. No mechanical thinning within site boundaries. Hand thinning permitted. 2. No piling or burning of slash	No Adverse

			within site boundaries**.** 3. Low intensity prescribed fire permitted	
2446	Unevaluated	[redacted]	1. No mechanical thinning within site boundaries. Hand thinning permitted. 2. No piling or burning of slash within site boundaries**.** 3. Low intensity prescribed fire permitted	No Adverse
2447	Unevaluated	[redacted]	1. No mechanical thinning within site boundaries. Hand thinning permitted. 2. No piling or burning of slash within site boundaries**.** 3. Low intensity prescribed fire permitted	No Adverse
2364	Unevaluated	[redacted]	1. No mechanical thinning within site boundaries. Hand thinning permitted. 2. No piling or burning of slash within site boundaries**.** 3. Low intensity prescribed fire permitted	No Adverse
3152	Unevaluated	[redacted]	1. No mechanical thinning within site boundaries. Hand thinning permitted. 2. No piling or burning of slash within site boundaries**.** 3. Low intensity prescribed fire permitted	No Adverse
3154	Unevaluated	[redacted]	1. No mechanical thinning within site boundaries. Hand thinning permitted. 2. No piling or burning of slash within site	No Adverse

			boundaries. 3. Low intensity prescribed fire permitted	
3155	Unevaluated		1. No mechanical thinning within site boundaries. Hand thinning permitted. 2. No piling or burning of slash within site boundaries. 3. Low intensity prescribed fire permitted	No Adverse
3228	Unevaluated		1. No mechanical thinning within site boundaries. Hand thinning permitted. 2. No piling or burning of slash within site boundaries. 3. Low intensity prescribed fire permitted	No Adverse
3233	Unevaluated		1. No mechanical thinning within site boundaries. Hand thinning permitted. 2. No piling or burning of slash within site boundaries. 3. Low intensity prescribed fire permitted	No Adverse
3234	Unevaluated		1. No mechanical thinning within site boundaries. Hand thinning permitted. 2. No piling or burning of slash within site boundaries. 3. Low intensity prescribed fire permitted	No Adverse
3236	Unevaluated		1. No mechanical thinning within site boundaries. Hand thinning permitted. 2. No piling or burning of slash within site boundaries.	No Adverse

			3. Low intensity prescribed fire permitted	
3237	Determined *ineligible* 11/20/2016	Trash Scatter	No protection required.	NA
3239	Unevaluated	[redacted]	1. No mechanical thinning within site boundaries. Hand thinning permitted. 2. No piling or burning of slash within site boundaries**.** 3. Low intensity prescribed fire permitted	No Adverse
3294	Determined *ineligible* 11/30/2016	Pine Flat Tank	No protection required.	NA
3295	Unevaluated	[redacted]	1. No mechanical thinning within site boundaries. Hand thinning permitted. 2. No piling or burning of slash within site boundaries**.** 3. Low intensity prescribed fire permitted	No Adverse
3296	Unevaluated	[redacted]	1. No mechanical thinning within site boundaries. Hand thinning permitted. 2. No piling or burning of slash within site boundaries**.** 3. Low intensity prescribed fire permitted	No Adverse
3297	Eligible as per PMOA	[redacted]	1. No mechanical thinning within site boundaries. Hand thinning permitted. 2. No piling or burning of slash within site boundaries**.** 3. Low intensity prescribed fire permitted	No Adverse
3298	Eligible as per	[redacted]	1. No mechanical	No Adverse

	PMOA	[redacted]	thinning within site boundaries. Hand thinning permitted. 2. No piling or burning of slash within site boundaries. 3. Low intensity prescribed fire permitted	
3299	Eligible as per PMOA	[redacted]	1. No mechanical thinning within site boundaries. Hand thinning permitted. 2. No piling or burning of slash within site boundaries. 3. Low intensity prescribed fire permitted	No Adverse
3311	Eligible as per PMOA	[redacted]	1. No mechanical thinning within site boundaries. Hand thinning permitted. 2. No piling or burning of slash within site boundaries. 3. Low intensity prescribed fire permitted	No Adverse
3312	Eligible as per PMOA	[redacted]	1. No mechanical thinning within site boundaries. Hand thinning permitted. 2. No piling or burning of slash within site boundaries. 3. Low intensity prescribed fire permitted	No Adverse
3313	Eligible as per PMOA	[redacted]	1. No mechanical thinning within site boundaries. Hand thinning permitted. 2. No piling or burning of slash within site boundaries. 3. Low intensity prescribed fire permitted	No Adverse
3314	Eligible as per		1. No mechanical thinning within site	No Adverse

	PMOA		boundaries. Hand thinning permitted. 2. No piling or burning of slash within site boundaries. 3. Low intensity prescribed fire permitted	
3315	Eligible as per PMOA		1. No mechanical thinning within site boundaries. Hand thinning permitted. 2. No piling or burning of slash within site boundaries. 3. Low intensity prescribed fire permitted	No Adverse
3316	Determined *ineligible* 11/30/2016	Road Hollow Tank	No protection required.	NA
3317	Unevaluated		1. No mechanical thinning within site boundaries. Hand thinning permitted. 2. No piling or burning of slash within site boundaries. 3. Low intensity prescribed fire permitted	No Adverse
3318	Unevaluated		1. No mechanical thinning within site boundaries. Hand thinning permitted. 2. No piling or burning of slash within site boundaries. 3. Low intensity prescribed fire permitted	No Adverse
3319	Eligible as per PMOA		1. No mechanical thinning within site boundaries. Hand thinning permitted. 2. No piling or burning of slash within site boundaries. 3. Low intensity prescribed fire	No Adverse

			permitted	
3320	Unevaluated		1. No mechanical thinning within site boundaries. Hand thinning permitted. 2. No piling or burning of slash within site boundaries**.** 3. Low intensity prescribed fire permitted	No Adverse
3321	Unevaluated		1. No mechanical thinning within site boundaries. Hand thinning permitted. 2. No piling or burning of slash within site boundaries**.** 3. Low intensity prescribed fire permitted	No Adverse
3322	Unevaluated		1. No mechanical thinning within site boundaries. Hand thinning permitted. 2. No piling or burning of slash within site boundaries**.** 3. Low intensity prescribed fire permitted	No Adverse
3323	Unevaluated		1. No mechanical thinning within site boundaries. Hand thinning permitted. 2. No piling or burning of slash within site boundaries**.** 3. Low intensity prescribed fire permitted	No Adverse
3324	Unevaluated		1. No mechanical thinning within site boundaries. Hand thinning permitted. 2. No piling or burning of slash within site boundaries**.** 3. Low intensity prescribed fire permitted	No Adverse

Effects: If the above design criteria are met and implemented, the *Proposed Action* alternative should have *no direct* or *indirect adverse effects* to heritage resource sites. However, reducing fuel loads around and within heritage sites would provide a beneficial effect to these resources by making them less susceptible to damages frequently incurred during high intensity wildfire events.

Many historic properties and artifacts are susceptible to damage from high intensity fire and can suffer significant adverse effects. Artifacts made of flammable materials such as wood, paper, leather, and such can be totally consumed by a high temperatures while glass, bone, and metal can melt or become extremely friable. Prehistoric stone artifacts, masonry, and rock art can spall and crack. Pottery and rock art panels can stain. Additionally, post fire effects such as water and wind erosion are also amplified when vegetation is completely consumed, and typically cause some of the worst damage to sites.

Reducing heavy fuels at sites can help curb damages to surface and shallow subsurface artifacts and features, as well as reduce the potential for disturbance to artifacts and features by tip-ups of burned trees, collapsing of features as a result of root burn out, and wind and water erosion.

Cumulative Effects Analysis

Heritage resource sites are stationary, restricted in time and space. The cumulative effects boundary for this analysis is the project area. Project activities would be limited to the project area during the implementation period. In general, sites are protected from direct adverse effects by Forest Service actions through site avoidance or appropriate mitigation measures put in place by the agency. This limits cumulative damage and loss of sites over time. However, sites can suffer damaged from natural processes such as flood or wildfire events. And, public land users can impact sites through vandalism and looting activities, as well as unintentional damages associated with recreational use of the forest such as dispersed camping or resource gathering activities. All of these actions and events can generate cumulative effects.

Heritage resource sites are non-renewable. Because they are bound in time, they are also limited in quantity. While each individual site possesses unique characteristics, when viewed together, these resources combine to provide a synthesis of human history, i.e., the sum is greater than its parts. Over time, the number of ancient sites decreases due to destructive processes, both natural and human caused, despite efforts to preserve them. The cumulative impacts of human land use activities and natural processes serve to accelerate this loss. When artifacts or features are damaged or destroyed within a site, less information can be retrieved from the site. Eventually a site can lose its physical and scientific integrity. As additional individual sites are lost, there is a cumulative adverse

effect to the resource as a whole: the permanent loss of information that contributes to the understanding of the whole.

Actions to protect heritage resources from direct and indirect impacts from project implementation have been described in the above sections. Cumulative effects to cultural resource sites over time can be lessened through attentive land management. All official undertakings on the NKRD will continue to be inventoried for cultural resources. Sites at risk across the NKRD will continue to be monitored. Appropriate management actions will be taken to avoid or mitigate adverse effects to sites.

If the recommended mitigation design criteria measures are employed during implementation of the Burnt Corral project, there would be no adverse cumulative effects to heritage resources from implementation of the *Action* alternative. Rather, the project would potentially provide a beneficial effect to these resources in the event of a wildfire, by making them less susceptible to damages incurred from high intensity fire and thus a cumulative beneficial affect for the resource as a whole.

While there would be no cumulative effects from ground disturbing activities to heritage resources from the *No Action* alternative, if existing fuels are not treated within the project area, no action could have a cumulative significant adverse effect on this nonrenewable resource by increasing the likelihood that heritage sites will be damaged or lost during catastrophic wildfire events which frequently result in significant irreversible impacts to a non-renewable resource. These events are becoming more common.

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This Resource Specialist report was completed utilizing the best available science, a consideration of responsible opposing views, and the acknowledgment of any incomplete or unavailable information, scientific uncertainty, and risk. The EA incorporates information from this resource specialist. Based on my professional experience and judgment, I certify that this Resource Report is to the best of my knowledge, complete, true and accurate.

Signed /S/_Connie Reid_____ Date ___02/23/2018_____